Astrophysical Bulletin 2016 vol.71 N1, pages 82-94

Photometry and spectroscopy of the luminous red nova PSNJ14021678+5426205 in the galaxy M101

Goranskij V., Barsukova E., Spiridonova O., Valeev A., Fatkhullin T., Moskvitin A., Vozyakova O., Cheryasov D., Safonov B., Zharova A., Hancock T.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2016, Pleiades Publishing, Ltd.We present the results of the study of a red nova from the observations carried out with the Russian 6-m telescope (BTA) along with other telescopes of SAO RAS and SAI MSU. To investigate the nova progenitor,we used the data from the Digital Sky Survey and amateur photos available on the Internet. In the period between April 1993 and July 2014, the brightness of the progenitor gradually increased by (Formula presented.) in the V-band. At the peak of the first outburst in mid-November 2014, the star reached an absolute visual magnitude of (Formula presented.) but was discovered later, in February 2015, in a repeated outburst at the magnitude of (Formula presented.). The amplitude of the outburst was minimum among the red novae, only (Formula presented.) in V-band. The Hα emission line and the background of a cool supergiant continuum with gradually decreasing surface temperature were observed in the spectra. Such process is typical for red novae, although the object under study showed extreme parameters: maximum luminosity, maximum outburst duration, minimum outburst amplitude, unusual shape of the light curve. This event is interpreted as a massive OB star system components'merging accompanied by formation of a common envelope and then the expansion of this envelope with minimal energy losses.

http://dx.doi.org/10.1134/S1990341316010090

Keywords

binaries: close, novae, cataclysmic variables, stars: individual: PSNJ14021678+5426205